December 18, 2002

Mr. J. Tyler Carlson
Regional Manager, Phoenix Area Office
Western Area Power Administration
PO Box 6457
Phoenix, Arizona 85005-6457

Subject: 5 Year Integrated Resource Plan (2002-2007)

Dear Mr. Carlson:

Enclosed is the Five Year Integrated Resource Plan (IRP) report on Colorado River Commission (CRC) of Nevada. The enclosed report is submitted on behalf of the CRC and its retail power contractors, as an IRP Cooperative, pursuant to Western's request. CRC's retail power contractors are listed as follows:

Ampac, Inc.
Basic Water Company
Chemical Lime Company
Kerr-McGee Chemical LLC
Pioneer Americas LLC
Titanium Metals Corporation

Should you have any questions or comments, please do not hesitate to contact me at (702) 486-2692.

Sincerely,

Malvin R. Ware
Hydropower Program Manager

Enclosure
MRW/vld

INTEGRATED RESOURCE PLAN

for the

COOPERATIVE

consisting of

THE COLORADO RIVER COMMISSION

and its retail power customers

BASIC WATER COMPANY (aka BWC, Basic Management, Inc., BMI)

CHEMICAL LIME COMPANY OF ARIZONA (aka ChemLime, Chemstar)

KERR-MCGEE CHEMICAL LLC (aka Kerr-McGee)

PIONEER AMERICAS LLC (aka Pioneer)

AMERICAN PACIFIC CORPORATION (aka AMPAC, Pacific Engineering & Production Company)

TITANIUM METALS CORPORATION (aka Timet)

Table of Contents

Colorado River Commission Profile

The Colorado River Commission (Commission) is a state agency formed in 1935 and charged with the responsibility of securing and protecting rights and interest of the state in waters of the Colorado River and electric power generated thereon, including distribution. In 1947, the 1935 Act, which created the Commission, was amended to establish the Commission as negotiator for acquisition of federally owned industrial properties by the state. The amendment allowed the Commission to purchase and sell the Industrial plants, known as Plancor 501, located in Henderson (previously known as Basic), Nevada. The Commission's retail customers consist of the successors to those companies. The Commission holds Contracts for Federal Hydro Power from the Boulder Canyon Project, the Parker-Davis Project and the Salt Lake City Area Integrated Projects. These resources are distributed within the State of Nevada to Utilities serving southern Nevada and the Commission's retail customers.

Organizational Structure

The Commission is comprised of seven members. The Governor appoints the Chairman and four members of the Commission. Three members are appointed by, and are members of, the Board of Directors of the Southern Nevada Water Authority. The Commission does not request or receive any state tax allocations or federal funds to support its administrative and operating functions. These functions are funded solely from revenue received from water and power contractors and from the sale of land. Interest income earned from investments by the State Treasurer contributes to revenues.

Statutory Authority:	NRS 538.041 - .251 NRS 321.390 - .536
Staff:	30 employees and 3 Deputy Attorney Generals
Office:	Grant Sawyer Office Building 555 E. Washington Ave., Suite 3100 Las Vegas, NV 89101 Tel: (702) 486-2670 Fax: (702) 486-2695

Purpose

The mission of the Commission is to acquire, manage and protect all of Nevada's water and hydropower resources from the Colorado River for Southern Nevada. The Commission will seek new resources in a manner that will provide for future generations and continued quality growth while remaining a prudent steward of natural resources.

Vision

"...to be a respected state government agency providing low-cost energy resources to our valued customers, supporting the economic development needs of Southern Nevada, ensuring affordable and reliable water supplies and maintaining a strong customer service ethic".

Objective

The Commission's goal is to provide the lowest cost electrical resource, which meets it's retail customers requirements, using prudent business practices; to continue to provide the most affordable and reliable electric power to existing Commission customers; and to protect the interests of Nevada by serving on and monitoring a variety of forums dealing with power, water and environmental issues.

Be a leading participant in the Lower Colorado River Multi-Species Conservation Program in order to develop and implement projects for the conservation and recovery of endangered species within the Lower Colorado River Basin while optimizing power generation and water resource development.

Commissioners:

Richard W. Bunker, Chairman
Jay D. Bingham, Vice Chairman
Shari Buck, Commissioner
Lamond R. Mills, Commissioner
Bryan Nix, Commissioner
Roland D. Westergard, Commissioner
Myrna Williams, Commissioner

Public Participation

The IRP will be posted on CRC website for review and comments. The website address is: **www.state.nv.us/colorado_river/**.

IRP Contact Persons

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Retail Customers Profile

ChemLime, Kerr-McGee, Pioneer, Ampac and Timet in the following text are referred to as the Producing Companies. BWC along with the Producing Companies are the Commission's retail customers that receive federal hydropower.

BWC

BWC supplies raw water to the Producing Companies as well as the National Park Service, State of Nevada Lake Mead Fish Hatchery and the City of Henderson, Nevada. BWC was split off from Basic Management, Inc., along with Basic Power Company (BPC). The Director of Operations of BWC is also the Director of Operations of BPC that maintains the common electrical facilities at the industrial complex in Henderson where the Producing Companies are located. The Basic Power Company does not receive federal hydropower but was established primarily for construction and maintenance of the electrical facilities while BWC operates and maintains the water system serving the Producing Companies.

ChemLime

Chemical Lime is part of the Lhoist Group. Chemical Lime and the Lhoist group produce lime and lime based products throughout the United States, Canada, Europe, and other parts of the world.

Chemical Lime's Henderson plant produces the following products:

- Type-S hydrated lime ($CaMg(OH)2$. Type-S lime is used to make stucco, plaster, cement mortar and cement block.
- Dolomitic quicklime $CaMgO$. Dolo quicklime is used to manufacture steel and glass, and is also used by industries for desulferization.
- Sized Dolomitic Limestone $CaMgCO3$. Dolorrtitic Limestone is used for glass manufacturing, power plant desulferization, and water treatment.

Kerr-McGee

The Kerr-McGee Chemical LLC plant at Henderson, Nevada is part of the Kerr-McGee Corporation, which has holdings throughout the world. Total quality management guides all aspects of Kerr-McGee's chemical business. The focus is on customer satisfaction and cost control through ongoing measurement of work and plant processes. This corporate guide led to improvements to the Henderson plant in the past and will in the future. The electrolytic processes, which produce these products, require large amounts of electricity, the conservation of which translates to product marketability, which is the driving force for electrical conservation.

The primary products produced in the Henderson plant are:

- Manganese Dioxide (used in dry cell batteries.)
- Boron Trichloride (used to make high strength boron fibers for aircraft wings, golf clubs and tennis rackets.)
- Elemental Boron (used in car safety air bags.)

Pioneer

Pioneer's facility in Henderson, Nevada is owned by Pioneer Americas LLC, a subsidiary of Pioneer Companies Inc., a publicly traded company, which has additional production facilities. The Henderson Facility operates under Total Quality Improvement guidelines, which emphasizes satisfying customers and providing a quality product at a competitive price. The facility produces chlorine, caustic soda, hydrochloric acid and bleach. One of the primary raw materials for the facility is electrolytic power. Conservation of this energy in the process is a key requirement to stay competitive in the market. The facility is continuously striving to use the minimum amount of electricity per unit of production.

AMPAC

AMPAC, a Division of American Pacific Corporation, leases production facilities from Pioneer. The power provided to AMPAC by the Colorado River Commission is used by Pioneer to operate the leased facilities and produce Hydrochloric Acid, which is delivered to AMPAC. The acid is one of the constituents used by AMPAC in the manufacture of Perchlorate chemicals, which are used by NASA in the Space Launch Program, by commercial Space Launch Programs, to power Defense Launch Vehicles and in explosives and pyrotechnics.

Timet

Timet is the largest producer of titanium in the United States and Europe. The overall corporate network includes plants, mills and service centers in Nevada, California, Pennsylvania, New Jersey, Oregon, Ohio, England, France and Germany. An ISO 9000 Company, TIMET's goals are to continuously improve product, maintain customer focus and adhere to all policies and procedures. The Henderson facility produces titanium.

Goals and Objectives

The bottom-line goal of all six companies is to make a profit and earn a reasonable rate of return to investors. To reach this goal the companies continually endeavor to improve production processes, reduce waste, and increase production. Failure to reach these goals would place them in a disadvantaged position in the market in which they compete. Therefore, the companies must meticulously analyze every aspect of their manufacturing processes on an ongoing basis, including the use of electrical capacity and energy which represents a large part of the raw material required to produce their final product.

Historical Conservation Activities

Historically, the companies have maximized energy conservation measures, not as a result of a public law or Federal regulation, but due to economic necessity. For example:

- In 1986-87, Basic Power Company, installed equipment to correct the industrial sites power factor from 85.2% to 97.4%.

- Each of the Producing Companies continue to fund the maintenance and operating costs for the equipment as necessary to insure its continuing successful operation.

- Each company uses infrared heat detector equipment to identify problem areas and corrects the problems as they are found.

- Each company has retrofit its lighting system.

- Although replacement of existing electrical motors with more efficient motors cannot be economically justified, each company has adopted a practice of using high efficiency motors in new applications and to replace failed motors.

- Each company has accomplished remarkable energy savings by monitoring manufacturing processes and embracing newer, more efficient technology that also lowers system demands and energy use.

- Each company, based on need, has replaced transformers.

- Through Basic Power Company, the industrial complexes 5 and 15-kV distribution systems were replaced. The new distribution systems provide improved reliability, which translates as fewer process interruptions, improving product quality and deliveries, and reducing environmental upsets. In addition, the new distribution system reduced load losses by distributing loads over parallel conductors, includes new transformers supplying the 5-kV system, and includes a Supervisory Control and Data Acquisition (SCADA) system for controlling the facilities. The Producing Companies share in the costs and benefits of this project.

- Through the Commission, each company shares in the costs for the Basic Substation 230-kV to 13.8-kV step-down yard replacement. The cost for this work was in excess of $15,000,000. Savings varies with usage but are identifiable as a reduction in system losses as well as improved reliability of the facilities.

In addition to the above:

Timet has:

- Spent $45 million to upgrade production by replacing technologically outdated electrolytic cells with more energy efficient ones.

- Has an ongoing program to upgrade its production facilities and must partially or completely rebuild cells every two years to maintain electrical efficiency.

- Has converted the reduction process from gas-fired energy to electrical energy furnaces with a newly completed Vacuum Distillation Facility. This has saved in production costs over the low efficient gas-fired furnaces.

- Has replaced high bay lighting in most buildings with high efficient low energy lighting that requires less power to operate, produces greater illumination and less fixture count. Many of the light fixtures that have been replaced were 1000-watt incandescent fixtures.

- Conservation of energy has also been achieved by the insulation of the rotary dryer kilns and the generating of process steam by using the waste heat from the burning of carbon monoxide, a by-product of the titanium manufacturing process.

Kerr-McGee has:

- Spent $6 million in 1985 to replace carbon anodes in its manganese dioxide plant with titanium anodes. The company replaced 120 cells, with a reduction in energy of 27,255.10 kWh per cell per year, for annual reductions that have grown to 3,2717000 kWh per year and have resulted in accumulative energy reductions of 23,523,000 through 1992.

- Increased Manganese Dioxide Production in capacity from 16,000 tons to 28,500 tons.

- Relocated the Elemental Boron and Boron Trichlonde production units to modern, technically advanced facilities.

- Completed a $45 million facility at Apex in 1991, to cross blend and store Ammonium Perchlorate.

- Completed a $3 million vapor compression unit in 1990. The unit allows the facility to reuse more than 95% of its process water thereby significantly reducing the volume of wastewater sent to evaporation ponds.

- Built a modern Sodium Chlorate equipment at a cost of $14 million in 1988. The project has reduced chlorine emissions.

- Kerr-McGee spends approximately $25,000 per year on electric motors. Through 1992, Kerr-McGee had acted under a Conservation and Renewable Energy Program activity to always install the most energy efficient motor available. During this time, this activity resulted in a cumulative annual savings of 880,000 kWh per year. Often, though, the economics of installing the most energy efficient motors were not considered and some times the energy savings did not justify the additional costs. Since the signing of the Energy Policy Act of 1992 and the implementation of the Integrated Resource Plan methods by the Colorado River Commission of Nevada (CRC), Kerr-McGee has implemented a policy of installing the most efficient equipment, which makes economic sense. This approach results in energy savings and dollar savings, which can then be invested in additional improvements.

- Running at 8,000 amperes, an electrolytic cell using carbon anodes will use 241,384 kWh per year while producing "X" tons. However, a cell with titanium anodes will use only 214,129 kWh per year while producing the same tonnage. This results in a net savings of 27,255 kWh per year per cell. During 1996, Kerr-McGee estimates 42,166,000 kWh was saved by the installation of more energy efficient anodes. Further, with the installation of several more cells utilizing titanium anodes in December of 1996, Kerr-McGee estimates an annual savings of over 5,900,00O kWh.

- Has implemented a program using 400 watt High Pressure Sodium (HPS) lighting for general area lighting and 175 watt Metal Halide (MH) lighting in process areas where better color rendition is required. The HPS lamps represent an energy savings of 4,480 kWh per year, for each HPC lamp installed, when compared to the mercury vapor lighting they replaced. Similarly, the MH lamps provide an energy savings of 1,430 kWh per year per lamp installed, when compared to the mercury vapor lighting replaced.

Presently, Kerr-McGee has replaced mercury vapor lighting and installed approximately 150,000 watts of HPS lamps and an equal wattage of MHC lamps.

- Kerr-McGee conducts annual infrared (IR.) surveys through their insurance carriers. These IR. surveys are used to identify problems with electrical equipment as identified by elevated operating temperatures. The elevated temperatures also indicate energy inefficiency as the heating is caused by electrical energy being converted to thermal energy. The correction of the problem identified in the 1R survey protects equipment and reduces energy usage. Kerr-McGee estimates a cumulative energy savings due to lR. surveys of over 7,500,000 kWh for the period 1991 through 1996. This savings is in addition to the money saved by identifying electrical system problems before a failure occurred.

- During the period 1991 through 1996, Kerr-McGee spent in excess of $800,000 replacing 12 electric power transformers. The specifications for each of these units included options such as copper windings and low loss steel to reduce load and no-load losses thus improving efficiencies.

- In 1996, Kerr-McGee spent $700,000 installing a new boiler system for steam generation. The new boiler, with nameplate efficiency of 84 percent replaced two smaller boilers, which had efficiencies of 78 and 80 percent. Additionally, the boiler feed water pumps were upgraded and it was determined that replacing the existing steam turbine pumps with electric motor driven pumps would be more efficient and economical.

- Installed facilities to recover waste stream materials that are marketed or reintroduced into the process with the remaining tails more environmentally acceptable.

- Made additional improvements to titanium anodes to reduce maintenance, improve quality and. lower the voltage drop across the electrolytic cells.

BWC has:

- Renovated three existing Booster No. 1 pumps at an approximate cost of $100,000 each, which provided a ten percent increase in water delivery per unit with minimal energy increase. This translates to greater gallons per kWh.

- Replaced one existing 800HP Intake pump with a 400HP pump at an approximate cost of $150,000. This provides a ten percent reduction in energy consumption while maintaining delivery capacity.

- Complete replacement of remaining Intake pumps (total of three) at an approximate cost of $55,000 per unit. This provided a substantial reduction in energy consumption per unit while maintaining system delivery capacity.

- Installed a real time on line SCADA system at an approximate cost of $83,000 to match water delivery to water demand, and provide electrical demand monitoring.

- Upgraded Substation equipment by installing low loss 69/4.16 transformers at an approximate cost of $150,000. The energy savings varies with usage.

- Replaced two existing pumping plant kWh meters with JEM2 KWH metering at a cost of approximately $4,000. In addition to metering energy the meter allows the monitoring of power factor and demand to assist with conservation energy scheduling.

ChemLime has:

- Replaced transformers in 1994.

- Replaced its hydrate pump in 1994 increasing hydrate production by 60 percent while utilizing the same downstream equipment.

- Replaced its 14' air separator with a new 12' energy efficient air classifier in 1993.

- Has continuously upgraded the lighting with high efficiency sodium vapor lights.

- Replace kiln I. D. fan motors with high efficiency motors.

- Reduced production from four rotary kilns at the Henderson plant with the conversion of Kiln #1 at our Apex plant to dolomitic limestone. This resulted in the net savings of 4. OMMBTU and 20 kWh per ton of dolomitic quicklime produced.

- Installed a quicklime unloading System that reduces the amount of conveying equipment being utilized at the Henderson plant, saving an additional 4 kWh per ton.

- Replaced the quicklime storage and delivery system. This eliminates a large complex of conveying systems to and from the storage system.

Pioneer has:

- Implemented a preventative maintenance program of infrared temperature measurement of equipment connections, which catch problem areas before they cause upsets or shutdowns both of which use more energy than normal operations.

- Monitored and replaced the electrolytic cells, which use the bulk of the plants energy, based on performance and analysis to keep efficiencies at maximum.

- Added a fifth interconnection between each cell, which had the effect of lowering the voltage per cell by 10 millivolts. This is an overall voltage drop of 1.8 volts across the entire circuit. With the amperage usage at 72,000 amps DC, the savings is 3,110 kWh per day. The voltage can be read by a meter on the circuit. The cost of adding this interconnection to all of the cells was $110,000.

- Added a 6th interconnection between cells. This is an overall voltage drop of 10 millivolts per cell and 1.8 volts over the entire circuit. The savings results in 3,110 kWh per day, The cost of adding this interconnection to all of the cells was $110,000.

- Changed the individual spacers to half their diameter. This reduced the cell voltage by 60 millivolts per cell or 10.8 volts for the circuit. The savings results in 18,662 kWh per day operating at 72,000 amps through the cells.

- Implemented the re-coating of anodes, this preserves the integrity of the system and prevent using additional energy due to inefficiencies. Voltages can be measured to determine the savings.

- Implemented the Cleaning of cathode wrap arounds with a savings of 10 millivolts per cell or 1.8 volts for each circuit. Voltages can be measured to determine the savings.

Historical five-year Loads of Retail Customers

The Historical Consumption of Capacity and Energy for the Retail Customers is shown in Appendix 1. The peak demand for the calendar year is shown in kilowatts and the total energy purchased is shown in kilowatt-hours. The annual difference is shown as a percentage starting with the years 1996 and 1997. The "CRC Total" represents the total retail load of CRC.

Supply Side Resources

The Commission's federal resource, under contract, presently provides approximately 60 percent of the required resources to meet its retail customer's requirements. Spot market, short term and long term purchases of supplemental power are used to obtain the balance of the required resources.

The Commission has contracts with the federal government for power from the Boulder Canyon Project (1987-2017), the Parker-Davis Project (1988-2008) and the Salt Lake City Area City Area Integrated Project (1989-2004). The allocations from these projects are shown in Appendix 2.

The Commission has two non-federal long-term contracts for power with Duke Energy. To meet the monthly fluctuations of the Boulder Canyon Project resources, the Commission has entered into enabling agreements with suppliers for short term resources (less than one year) on an as ordered basis (spot market).

Demand Side Resources

As described above under Historical Conservation Activities, the companies have varying activities to maintain demand side control with the competitive market as incentive. Some of the activities the companies anticipate reviewing for possible implementation in the near future for this purpose, are as follows:

BWC

- Replace pumps when test indicate reduction in efficiency.

- Upgrade SCADA System to match delivery to demand.

ChemLime

- Waste reduction program is in effect to reclaim off spec and spilled material and the sale of by-products to new markets; reduces the total raw material consumption

- Conversion of hydrate customers from bagged product to bulk product results in less processing, therefore conservation of renewable and non renewable resources.

- Bagging production lime employees are on an incentive program to increase productivity, therefore improving energy consumption per product ton.

- Equipment not in use is shut down until needed.

Kerr-McGee

- Anode replacement.

- Reclaiming raw material from process waste using manufacturing process by products for production.

- Improve present electrical system.

- Install SCADA System for energy management.

Pioneer

- Monitor and replace the electrolytic cells, which use the bulk of the plants' energy, based on performance and analysis to keep efficiencies at a maximum.

- Continue the preventative maintenance program of infrared temperature measurement of equipment connections, which catch problem areas before they cause upsets or shutdowns both of which use more energy than normal operations.

- Continue program for re-coating of anodes when needed, this preserves the integrity of the system and prevent using additional energy due to inefficiencies. Voltages can be measured to determine the savings.

AMPAC

- Pioneer maintains and operates, the cell lines leased by Ampac. Ampac shares through this lease, the cost and benefits produced by Pioneer's conservation activities.

Timet

- Replacement of low efficient lighting and electrical equipment.

- Improvement of production cycles.

Identification and Comparison of Resource Options

As each of the Producing Companies review their projected sales (and consequently their electrical requirements) and estimated cost of electrical resources, a review of their demand side options (those listed above and any others that may come to light), the decision to proceed with demand side options or supply side resources will be made. Such comparisons are a continual process, and as seen by the historical record, demand side options are often chosen.

Load Estimates and Supplemental Resources

Electricity is a major raw material of five customers end products and therefore the required electrical resource is based on estimated sales of each product. The actual method of determining how much of each product is to be produced, which would translate into forecasting of electrical requirements, is proprietary for competitive reasons. The sixth customer, BWC, bases its pumping requirements on the estimates of the other five companies, which it serves. All six customers loads fluctuate with the market; however, due to the nature of their products, market fluctuations are normally recognized on an annual basis.

Five-Year Load Estimate

The five-year load estimate is included in Appendix 3.

Annual: Each year, the Commission issues a resource schedule to the retail customers showing estimated resources available to each contractor during the following three operating years. Each customer then submits a written load estimate for the same period. Each customers load estimate includes its estimated capacity and energy requirements for the full period. Following receipt of each customer's load estimates, the Commission issues to the customers an annual resource schedule showing adjusted estimated resources available to each customer for the period. Each retail customer has the option of requesting Commission to enter into long-term contracts for any required supplemental resource or to meet their supplemental power requirements from monthly purchases. If a long-term contract (one which exceeds 12 months) is requested, the Commission contacts various vendors identifying the customer's needs. The commission and customer for application, flexibility and cost effectiveness review each proposal the Commission receives in response to their request. If the Customer and Commission agree on a resource, a contract is entered into for the resource on a long-term basis.

Monthly: By the first day of each month, each contractor submits a written estimate of its load for the following month. The Commission compares estimated resources and estimated loads and advises the contractors of the estimated cost of purchasing supplemental capacity and energy if the contractor's loads are estimated to exceed estimated resources. Each contractor must then re-review its capacity and energy needs, review its cost of such capacity and energy, and determine whether to have the Commission make such purchases in its behalf, reduce production, or some combination of choices. After the contractor confirms its load estimates and if a decision is made to have the Commission acquire additional resources on its behalf, the Commission acquires the needed resources through competitive bidding from contractual sources.

Use of Least-Cost Options

The decision to purchase supplemental capacity and energy, implement demand side options or to reduce production is made by the retail customer based on production and marketing. The retail customers are businesses that must be efficiently run to remain competitive and stay in operation. The determination of which resource to purchase is made by the Commission and customer based on the least-cost resource which meets the requirements of the retail customers.

Minimization of Adverse Environmental Impacts of New Resources

The Commission is required to minimize adverse environmental effects of new resource acquisitions, to the extent practicable, and document these efforts in the IRP. Since CRC obtains all supplemental capacity and energy needs through purchases from existing generating plants, CRC does not impose any environmental impacts by acquiring new resources. CRC is oblivious to any environmental impacts of whether the generating plant used to produce the capacity and energy that CRC purchases are greater, or less, than they would be in the absence of such a purchase by CRC. When, and if, CRC obtains an interest in a generating plant environmental effects will be considered at that time and will be included in the IRP.

Action Plans

AMPAC

2003-2007 Short term and Long term

AMPAC is continuing to lease a cell line from Pioneer for the production of hydrochloric acid, which is used in the manufacture of ammonium Perchlorate at AMPAC's Utah plant. AMPAC continues to share, through this lease, the cost and benefits produced by Pioneers s conservation

BWC

Short Term 2003 - 2004

1. Continue with the upgrade program to complete the replacement of our existing pumps with high efficiency pumps at our Intake pumping plant. One unit is scheduled for completion during 2003 and 2004. Each high efficiency pump reduces energy consumption by approximately 11 percent (11%) over the previous model while maintaining similar flow rates.

2. Complete the replacement of the motor-generator sets with static solid-state exciters for each of the remaining five (5) synchronous motors at out Booster pumping plant

3. Continue with the rewinding of the single phase transformers at our Intake and Booster pumping plants substation utilizing increased energy efficient designs for the transformer.

Long Term 2005- 2007

1. Complete the renovation and upgrading of the remaining Booster plant rotating elements. A ten percent (10%) increase in water delivery per unit with no increase in energy consumption is anticipated.

2. Complete the installation of the high efficiency pumps at our Intake plant resulting in eleven percent (11%) reductions in energy consumption per unit.

3. Continue the rewinding of the substation transformers at each pumping plant with low loss transformers. The energy savings will depend on the efficiency of the new transformers.

ChemLime

Short Term and Long Term: (2003 - 2007)

1. Continue the conversion of our customers from bagged product to bulk product results in less processing and packaging, therefore conservation of renewable and non-renewable resources.

2. The Henderson Plant continues to improve productivity through process improvements and implementation of better maintenance practices. An interrogated Maintenance Management Program (M7P2) was implemented in 2002 to improve preventive maintenance scheduling and equipment availability. A Maintenance Planner position was also added in 2002, which will improve the implementation of the maintenance planning and scheduling tasks. Higher productivity will result in more efficient operation of the Plant and less KWH per ton of lime produced.

3. Equipment not used in the process will be dismantled and removed.

4. Replacing standard efficiency motors with premium efficiency motors when those motors fail. This will be for motors over 15 HP.

Kerr-McGee

Short Term and Long Term (2003 - 2007)

1. Titanium Anodes: Kerr-McGee's evaluating different anode configurations, anode materials, and anode coatings that may improve production or reduce costs by improving the operating efficiency of electrolytic cell lines. Some of the ways that the success of this work is measured by Kerr-McGee are by reduction in power requirements per ton of product, improvement in production per electrolytic cell or improvements in the quality of the material produced.

2. Cogeneration: From time to time, Kerr-McGee receives proposals from developers of cogeneration facilities for the installation of such an operation at our manufacturing plant. The steam would be marketed to Kerr-McGee and the other industrial plants in the area

and the power could be sold into the grid or used by the manufacturing facilities for load shedding or demand reduction.

3. SCADA System: The installation of a Supervisory Control And Data Acquisition System to replace the plant metering equipment would provide additional details on the plant's power usage profile and may help to make incremental improvements in plant efficiency. The installation of such a system is being evaluated and the measure of success would likely be the reduction in plant demand and/or power usage.

4. Maintenance: Over the years, Kerr-McGee has made many improvements to increase the efficiency of there manufacturing plant. Additionally, we have participated with our utility, the Colorado River Commission of Nevada, and the local power system maintenance company, Basic Power Company, on a new power distribution cabling system, new substations, and new substation equipment, which reduced losses and saved power. Kerr-McGee and all of the parties recognize that proper maintenance and operation of this equipment is necessary to continue receiving the benefits of reduced power usage. Kerr-McGee will continue to participate with the parties in the beneficial operation and maintenance of these facilities. The evidence of the proper operation and maintenance of this equipment is shown in its continued operation and the continuation of the efficiency improvements made.

5. Cell Redesign: Electrolytic processes include electrolytic cells where a large amount of power is used. Kerr-McGee is actively working on a new design for its electrolytic cells that would significantly improve the operation of these cells. The success of this work may be seen in reduced power used per ton of production and improvements in the quality of the product manufactured.

Pioneer

Short Term and Long Term (2003 – 2007)

1. Re-coating of Anodes. This will preserve the integrity of the system and prevent using additional energy due to inefficiencies. The cost of doing this is unknown at this time. Voltages can be measured to determine the savings

2. Use of higher efficiency motors and improved lighting. Evaluation of higher efficiency motors in several areas of the plant will result in energy savings. Also upgraded plant lighting will result in lower power usage. The cost of doing this is unknown at this time

3. Installation of a brine heating system in the brine processing area. Installation of this heating system will improve the hardness removal capability of the cell feed brine, which result in higher efficiency for the chlorine circuit. This higher efficiency results in lower power consumption for the same operating rate. The cost of doing this is approximately $250,000 in capital expenditure

Timet

Short Term and Long Term (2003 - 2007)

1. Employ the Theory of Constraint procedure to reduce bottlenecks in the production process. This will reduce cycle time and improve on-time deliveries to customers.

2. Replacement of low efficient electrical equipment.

3. Continue the infrared monitoring program to eliminate high resistance points in transmission cables and electrical equipment.

Demonstration of Methods to Validate Predicted Performance

BWC

- Installation of new pumps. With pump test information on a periodical basis, BWC can chart an efficiency pattern, which will dictate maintenance and replacement at the most beneficial time sequences and power savings. Comparisons of energy consumption per gallon of water before and after installation of each new pump can be made available.

ChemLime

- Reduction of rotary kilns. Savings can be identified by reduction in kWhs per ton the cost has not been identified.

- Unloading system. Savings can be identified by reduction in kWhs per ton. The cost has not been identified.

- Replace storage and delivery system. Savings would be the resources used by the equipment replaced

- Closure of kilns. Savings would be from moving the process closer to the raw material source. Estimated cost and savings are being reviewed.

Kerr-McGee

- New Anodes. Savings in electric energy should be quantifiable by a reduction in the kWh per ton for the product. Cost of this program is unknown

- Recovering raw materials. Costs for this project are being developed at this time. Benefits would be measurable by the value of the products sold and the reduction in the amounts of raw materials purchased.

- On-site generation. Costs would be dependent on the facility design. Benefits could include reduced peak demand and energy usage.

- Installation of SCADA System. Costs would be determined based on the system design. Savings could include reduced usage of energy for auxiliaries, reduced demand peak and improved reliability.

Pioneer

- Addition of a 6th interconnection between cells. Savings would be identified by measuring the voltage reduction per Circuit.

- Change individual spacers to half their diameter. Savings would be identified by measuring the voltage reduction per circuit.

- Re-coating anodes. Savings would be identified by measuring the voltage reduction.

- Cleaning cathode wrap arounds. Savings would be identified by measuring the voltage reduction.

- Replace step-down yard. Savings would be identifiable as a reduction in system losses as well as improved reliability of the facilities.

AMPAC

Ampac has leased a cell line from Pioneer for the production of hydrochloric acid, which is used in the manufacture of Ammonium Perchlorate at AMPAC's Utah Plant. Pioneer maintains and operates the cell line leased by Ampac. Ampac shares through this lease, the cost and benefits produced by Pioneers conservation activities.

Timet

- Replacement of low efficient lighting. Savings could be calculated by multiplying the number of lighting units installed by the difference in the efficiency of the lights replaced.

- Replacement of Inefficient electrical equipment. Savings could be calculated by multiplying the difference between the efficiency of the original equipment and the replacement equipment by the estimated usage of the equipment.

- Replace step-down yard. Savings would be identifiable as a reduction in system losses as well as improved reliability of the facilities.

To the best of our knowledge, this Integrated Resource Plan meets all the requirements identified by the Western Area Power Administration for such a plan.

Colorado River Commission

Signature on File__________
George M. Caan
Executive Director

Basic Water Company

Signature on File____________
Colen Watts
Director of Water and Power Operations

Titanium Metals Corporation

Signature on File__________
John Sanderson
Plant Manager

Chemical Lime Company

Signature on File____________
Rex Simpson
Plant Manager

Kerr-McGee Chemical LLC

Signature on File__________
Fredrick R. Stater
Plant Manager

Pioneer Americas LLC

Signature on File____________
David A. Scholes
Vice President

American Pacific Corporation

Signature on File__________
Jack L. Stonehocker – Consultant OR
John Gibson – President

HISTORICAL 5 - YEAR LOAD DATA

Appendix 1

October-September	1997	1998	% Diff.	1999	% Diff.	2000	% Diff.	2001	% Diff.	2002	% Diff
BWC	8760	8760		8760		8760		8760		8760	
Peak Demand MW	6.338	5.499	-13.2%	6.379	16.0%	6.106	-4.3%	6.134	0.5%	6.201	1.1%
Energy MWH	34,301	33,267	-3.0%	27,544	-17.2%	30,710	11.5%	28,289	-7.9%	30,474	7.7%
Load Factor	0.617804	0.690599	11.8%	0.492913	-28.6%	0.574141	16.5%	0.526465	-8.3%	0.561001	6.6%
TIMET											
Peak Demand MW	42.7	50.922	19.3%	42.676	-16.2%	32.005	-25.0%	37.352	16.7%	37.712	1.0%
Energy MWH	279,900	358,438	28.1%	242,603	-32.3%	215,691	-11.1%	256,192	18.8%	258,853	1.0%
Load Factor	0.748292	0.803534	7.4%	0.648946	-19.2%	0.769325	18.6%	0.782974	1.8%	0.783555	0.1%
PIONEER											
Peak Demand MW	38.708	37.792	-2.4%	40.238	6.5%	39.639	-1.5%	39.67	0.1%	39.86	0.5%
Energy MWH	309,457	271,341	-12.3%	293,244	8.1%	327,909	11.8%	283,294	-13.6%	307,852	8.7%
Load Factor	0.912632	0.819618	-10.2%	0.831934	1.5%	0.944336	13.5%	0.815213	-13.7%	0.881659	8.2%
CHEMLIME											
Peak Demand MW	1.213	0.902	-25.6%	0.651	-27.8%	0.662	1.7%	0.646	-2.4%	0.632	-2.2%
Energy MWH	8,384	3,593	-57.1%	3,168	-11.8%	3,182	0.4%	3,033	-4.7%	2,952	-2.7%
Load Factor	0.789017	0.454723	-42.4%	0.555520	22.2%	0.548704	-1.2%	0.535964	-2.3%	0.533206	-0.5%
KERR-McGEE											
Peak Demand MW	20.002	13.428	-32.9%	11.395	-15.1%	10.486	-8.0%	13.617	29.9%	11.552	-15.2%
Energy MWH	130,778	87,511	-33.1%	80,772	-7.7%	78,561	-2.7%	82,350	4.8%	75,403	-8.4%
Load Factor	0.746375	0.743956	-0.3%	0.809175	8.8%	0.855250	5.7%	0.690364	-19.3%	0.745122	7.9%
AMPAC INC.											
Peak Demand MW	15.624	15.077	-3.5%	16.053	6.5%	15.811	-1.5%	15.826	0.1%	15.901	0.5%
Energy MWH	123,980	113,128	-8.8%	121,372	7.3%	132,661	9.3%	113,183	-14.7%	123,869	9.4%
Load Factor	0.905848	0.856547	-5.4%	0.863094	0.8%	0.957811	11.0%	0.816406	-14.8%	0.889271	8.9%
CRC TOTAL											
Peak Demand MW	124.585	123.62	-0.8%	117.392	-5.0%	104.709	-10.8%	113.245	8.2%	111.858	-1.2%
Energy MWH	886,800	867,278	-2.2%	768,703	-11.4%	788,714	2.6%	766,341	-2.8%	799,403	4.3%
Load Factor	0.812561	0.800876	-1.4%	0.747508	-6.7%	0.859867	15.0%	0.772501	-10.2%	0.815821	5.6%

Federal Hydro Power Contract Allocations

Appendix 2

Boulder Canyon Project

	BWC	TIMET	PIONEER	CHEMLIME	KERR-KcGEE	AMPAC INC	TOTAL
Capacity kw	4,827	21,397	15,207	382	17,649	10,625	70,087
Energy kwh	9,738,148	113,070,710	75,200,137	2,164,033	75,561,510	49,952,389	325,686,927

Parker-Davis Project

	BWC	TIMET	PIONEER	CHEMLIME	KERR-KcGEE	AMPAC INC	TOTAL
Capacity kw							
summer	3,022	13,396	9,521	239	17,702	0	43,880
winter	2,130	9,446	6,713	169	12,482	0	30,940
Energy kwh							
summer	4,482,998	52,052,585	34,618,705	996,222	57,780,859	0	149,931,369
winter	1,597,697	18,551,042	12,337,775	355,044	20,592,545	0	53,434,103

Salt Lake City Area Integrated Projects

	BWC	TIMET	PIONEER	CHEMLIME	KERR-KcGEE	AMPAC INC	TOTAL
Capacity kw							
summer	0	0	0	0	0	2,963	2,963
winter	0	0	0	0	0	3,896	3,896
Energy kwh							
summer	0	0	0	0	0	6,544,964	6,544,964
winter	0	0	0	0	0	8,670,466	8,670,466

Total Resources

Maximum Capacity kw

	BWC	TIMET	PIONEER	CHEMLIME	KERR-KcGEE	AMPAC INC	TOTAL
summer	7,849	34,793	24,728	621	35,351	13,588	116,930
winter	6,957	30,843	21,920	551	30,131	14,521	104,923

Annual energy kwh

	BWC	TIMET	PIONEER	CHEMLIME	KERR-KcGEE	AMPAC INC	TOTAL
	15,818,843	183,674,337	122,156,617	3,515,299	153,934,914	65,167,819	544,267,829

YEAR LOAD DATA FORECAST

Appendix 3

October-September	2002	2003	% Diff.	2004	% Diff.	2005	% Diff.	2006	% Diff.	2007	% Diff
BWC	8760	8760		8760		8760		8760		8760	
Peak Demand MW	6.201	6.1	-1.6%	6.1	0.0%	6.1	0.0%	6.1	0.0%	6.1	0.0%
Energy MWH	30,474	30,050	-1.4%	30,050	0.0%	30,050	0.0%	30,050	0.0%	30,050	0.0%
Load Factor	0.561001	0.562355	0.2%	0.562355	0.0%	0.562355	0.0%	0.562355	0.0%	0.562355	0.0%
TIMET											
Peak Demand MW	37.712	33	-12.5%	33	0.0%	33	0.0%	33	0.0%	33	0.0%
Energy MWH	258,853	216,400	-16.4%	241,200	11.5%	240,600	-0.2%	240,600	0.0%	240,600	0.0%
Load Factor	0.783555	0.748582	-4.5%	0.834371	11.5%	0.832296	-0.2%	0.832296	0.0%	0.832296	0.0%
PIONEER											
Peak Demand MW	39.86	39	-2.2%	39	0.0%	39	0.0%	39	0.0%	39	0.0%
Energy MWH	307,852	335,009	8.8%	335,937	0.3%	335,009	-0.3%	335,009	0.0%	335,009	0.0%
Load Factor	0.881659	0.980591	11.2%	0.983307	0.3%	0.980591	-0.3%	0.980591	0.0%	0.980591	0.0%
CHEMLIME											
Peak Demand MW	0.632	0.625	-1.1%	0.625	0.0%	0.625	0.0%	0.625	0.0%	0.625	0.0%
Energy MWH	2,952	3,385	14.7%	3,385	0.0%	3,385	0.0%	3,385	0.0%	3,385	0.0%
Load Factor	0.533206	0.618265	16.0%	0.618265	0.0%	0.618265	0.0%	0.618265	0.0%	0.618265	0.0%
KERR-McGEE											
Peak Demand MW	11.552	12.028	4.1%	18.8	56.3%	19.2	2.1%	19.6	2.1%	19.6	0.0%
Energy MWH	75,403	75,900	0.7%	97,500	28.5%	152,450	56.4%	155,600	2.1%	158,900	2.1%
Load Factor	0.745122	0.720351	-3.3%	0.592029	-17.8%	0.906405	53.1%	0.906253	0.0%	0.925473	2.1%
AMPAC INC.											
Peak Demand MW	15.901	16	0.6%	16	0.0%	16	0.0%	16	0.0%	16	0.0%
Energy MWH	123,869	134,191	8.3%	134,563	0.3%	134,191	-0.3%	134,191	0.0%	134,191	0.0%
Load Factor	0.889271	0.957413	7.7%	0.960067	0.3%	0.957413	-0.3%	0.957413	0.0%	0.957413	0.0%
CRC TOTAL											
Peak Demand MW	111.858	106.753	-4.6%	113.525	6.3%	113.925	0.4%	114.325	0.4%	114.325	0.0%
Energy MWH	799,403	794,935	-0.6%	842,635	6.0%	895,685	6.3%	898,835	0.4%	902,135	0.4%
Load Factor	0.815821	0.850056	4.2%	0.847313	-0.3%	0.897495	5.9%	0.897500	0.0%	0.900796	0.4%